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EXAMINER

AGGARWAL, YOGESH K

ART UNIT	PAPER NUMBER
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2615

4

DATE MAILED: 02/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/676,998

Applicant(s)

PINE, JOSHUA I.

Examiner

Yogesh K Aggarwal

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 September 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 3.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

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*Specification*

1. The disclosure is objected to because of the following informalities:
  - i. Page 2, lines 12-13: insert copending Application serial No. ~~09/676551~~.Appropriate correction is required.

*Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-5, 7-9 are rejected under 35 U.S.C. 102(e) as being anticipated by Yahav et al. (US Patent # 6,057,909).

[Claim 1]

A digital camera (figure 17A: 240) comprising:

a processor having memory (It is inherent that the video processor 116 or the controller 126 has a memory);

a substrate (figure 17A: 241) having at least one pixel (figure 17A: 242) disposed thereon for absorbing light from an object,

the at least one pixel being electrically coupled to the processor (figure 17A: 116) for

storing a digital image of the object in the memory of the processor [It is inherent that the

video processor 116 or the controller 126 have a memory that stores a digital image of the

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object in the absence of an external memory or any other memory disclosed in the reference]; and

an electromechanical shutter mechanism (figure 17A: 244)[Col. 12 lines 42-47 disclose that the shutter mechanism can be a high-speed mechanical shutter. It will be electromechanical because it is being electrically controlled by controller 126]; moveably associated with the at least one pixel (col. 25 lines 17-22).

and having a first position and a second position that are selected according to commands from the processor of the digital camera, the first position exposing the at least one pixel to the light from the object and the second position preventing the exposure of the at least one pixel to the light (col. 25 lines 17-28).

[Claim 2]

The digital camera of claim 1 wherein the substrate has a plurality of pixels (figure 17A: 242) disposed thereon and the electromechanical shutter mechanism includes a plurality of individual shutters (figure 17A: 246) that are each associated with a corresponding subset of the plurality of pixels, the plurality of individual shutters of the electromechanical shutter mechanism being configured to move from the first position to the second position simultaneously (col. 25 lines 17-28)[The different shutter elements can be modulated to open and shut at the same time means that the electromechanical shutter mechanism is configured to move from the first position to the second position simultaneously].

[Claim 3]

The digital camera of claim 2 wherein the electromechanical shutter mechanism is configured to be moved between the first position and the second position within the

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plane of the substrate (The shutter mechanism 244 disclosed in figure 17A is within the plane of the substrate).

[Claim 4]

The digital camera of claim 3 wherein the electromechanical shutter mechanism comprises a planar surface having a plurality of openings that each correspond to a position of one of the plurality of pixels (col. 25 lines 17-22)[The shutter mechanism 244 disclosed in figure 17A has a planar surface and each opening correspond to a position of one of the plurality of pixels].

wherein the electromechanical shutter mechanism exposes the plurality of pixels through the plurality of openings when the electromechanical shutter mechanism is in the first position (col. 25 lines 17-28)[hen the different shutter elements 246 are modulated to be in an open position the light can pass so that the pixels are exposed].

[Claim 5]

The digital camera of claim 2 wherein the corresponding subset of the plurality of pixels comprises a row of pixels [Figure 17A discloses the individual shutters corresponding to a row of pixels].

[Claim 7]

An image capturing device (figure 17A: 240) comprising:

an adjustable aperture ["an adjustable aperture" is read as a shuttering device which adjusts the quantity of light by the movement of an aperture as disclosed in figure 17A: 244] that allows light to pass through when opened and that prevents light from passing through when closed (col. 25 lines 17-28)[When the different shutter elements 246 are

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modulated to be in an open position the light can pass so that the pixels are exposed and when they are shut the light cannot pass through];

a substrate (figure 17A: 241) having a plurality of pixels (figure 17A: 242) disposed thereon for capturing the light that passes through the adjustable aperture (col. 25 lines 17-22);

a shutter mechanism (figure 17A: 244) that is used to control the amount of the light that the plurality of pixels receive when the adjustable aperture is opened, the shutter mechanism simultaneously adjusting the amount of light that each of the plurality of pixels receives (col. 25 lines 17-28)[When the different shutter elements 246 are open, they can be modulated which means adjusts the quantity of light that can be received on a particular pixel 242 depending upon its distance window]; and

a processing device for storing the data that is captured in each of the plurality of pixels such that the image capturing device is able to generate an image that is created by the light that passes through the adjustable aperture [It is inherent that the video processor 116 or the controller 126 have a memory that stores a digital image of the object in the absence of an external memory or any other memory disclosed in the reference].

[Claim 8]

The image capturing device of claim 7 wherein the shutter mechanism comprises a first position and a second position, the first position being an open position that exposes the plurality of pixels to the light that passes through the adjustable aperture and the second position being a closed position that prevents exposure of the plurality of pixels to the light that passes through the adjustable aperture (col. 25 lines 17-28)[The different shutter elements can be modulated to open and shut means that the electromechanical shutter

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mechanism in its first position (open) that exposes the plurality of pixels to the light that passes through the adjustable aperture and in the second position (shut) prevents exposure of the plurality of pixels to the light that passes through the adjustable aperture].

[Claim 9]

The image capturing device of claim 8 wherein the shutter mechanism comprises a flat surface positioned in the plane of the substrate, the flat surface having a plurality of openings that correspond with the plurality of pixels on the substrate and being moveably adjustable in the plane of the substrate such that the openings of the flat surface either expose or prevent exposure of the plurality of pixels on the substrate (col. 25 lines 17-28)[The shutter mechanism 244 disclosed in figure 17A has a planar surface and each opening correspond to a position of one of the plurality of pixels].

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 6, 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yahav et al. (US Patent # 6,057,909) in view of Nishioka (US Patent # 6,437,925).

[Claim 6]

Yahav teaches the following limitations:

The digital camera of claim 5 wherein the individual shutters of the electromechanical shutter mechanism each comprise an elongate shutter that extends along the row of pixels

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[Figure 17A discloses the individual shutters 246 comprising an elongate shutter and extending along the row of pixels 242].

Yahav fails to teach the following limitations. The elongate shutter having hinges coupled at least at each end such that the elongate shutter moves between the first position and the second position with respect to the row of pixels, the first position being perpendicular to the substrate and the second position being slightly off perpendicular so that the individual shutter creates a shadow on the row of pixels. However these limitations are known in the art as disclosed in Nishioka (col. 27 lines 22-34, lines 46-49, figure 39, 40: 188) [The light blocking plates 192 move such that when they are in perpendicular position w.r.t the optical surface the light is not blocked and when they are in an off perpendicular position the light is blocked. It is implicit in the reference that when the light blocking plates move up or down they are supported on hinges]. Therefore taking the combined teachings of Yahav and Nishioka it would have been obvious to one skilled in the art to have an elongate shutter having hinges coupled at least at each end such that the elongate shutter moves between the first position and the second position with respect to the row of pixels, the first position being perpendicular to the substrate and the second position being slightly off perpendicular so that the individual shutter creates a shadow on the row of pixels. Doing so the shutters used in Yahav can be made such that they are perpendicular to the substrate and in an off position to the perpendicular position in order to block the light and also to construct the shutters on the same substrate as the pixels as taught in Nishioka (col. 27 lines 59-63).

[Claim 10]



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Yahav teaches the limitations of claim 8 but fails to teach "... wherein the shutter mechanism comprises a plurality of elongate surfaces that, when in the first position, extend perpendicularly upward from the substrate, each of the plurality of elongate surfaces having at least two hinges between the substrate and a bottom edge of the elongate surface such that the plurality of elongate surfaces may move between the first position and the second position when the processing device so commands the at least two hinges". However these limitations are known in the art as disclosed in Nishioka (col. 27 lines 22-34, lines 46-49, figure 39, 40: 188)[The light blocking plates 192 move such that when they are in perpendicular position w.r.t the optical surface the light is not blocked and when they are in an off perpendicular position the light is blocked. It is implicit in the reference that when the light blocking plates move up or down they are supported on hinges]. Therefore taking the combined teachings of Yahav and Nishioka it would have been obvious to one skilled in the art to have a shutter mechanism comprising a plurality of elongate surfaces that, when in the first position, extend perpendicularly upward from the substrate, each of the plurality of elongate surfaces having at least two hinges between the substrate and a bottom edge of the elongate surface such that the plurality of elongate surfaces may move between the first position and the second position when the processing device so commands the at least two hinges. Doing so the shutters used in Yahav can be made such that they are perpendicular to the substrate to let the light pass through and in an off position to the perpendicular position in order to block the light and also to construct the shutters on the same substrate as the pixels as taught in Nishioka (col. 27 lines 59-63).

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6. Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yahav et al. (US Patent # 6,057,909) in view of Bawolek et al. (US PG-PUB # 2004/0012029).

[Claim 11]

Yahav teaches the following:

A method for an image capturing device (Yahav, figure 17A: 240) to control pixel exposure of a plurality of pixels (figure 17A: 242) on a substrate (figure 17A: 241), the image capturing device (figure 17A: 240) including a shutter mechanism (figure 17A: 244) that provides a first shutter setting and a second shutter setting (Yahav, col. 25 lines 17-25), the method comprising:

arranging the plurality of pixels to operate with the shutter mechanism such that the first shutter setting provides the plurality of pixels with exposure to a light source and the second shutter setting prevents the exposure of the plurality of pixels to the light source (Yahav, col. 25 lines 17-28);

Yahav fails to teach the following limitations “ exposing the plurality of pixels to the light source for a predetermined period of time; measuring a saturation point for each of the plurality of pixels; capturing, with each of the plurality of pixels, a data representation of a portion of the light source; recognizing that the saturation point for at least one of the plurality of pixels has been reached; and positioning the shutter mechanism in the second shutter setting, thereby discontinuing the exposure of the plurality of pixels to the light source”. However these limitations are known in the art as disclosed in Bawolek et al.

(Paragraphs 11 and 12)[When the pixels are saturated, the exposure to the light source is stopped which means that they are exposed for a predetermined amount of time].

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Therefore taking the combined teachings of Yahav and Bawolek it would have been obvious to one skilled in the art to expose the plurality of pixels to the light source and measuring a saturation point for each of the plurality of pixels; capturing, with each of the plurality of pixels, a data representation of a portion of the light source; recognizing that the saturation point for at least one of the plurality of pixels has been reached; and positioning the shutter mechanism in the second shutter setting, thereby discontinuing the exposure of the plurality of pixels to the light source. Doing so would allow us to avoid blooming and other saturation artifacts in the saturated pixels as taught in Bawolek (Paragraph 0012).

[Claim 12]

The method of claim 11 wherein said positioning the shutter mechanism in the second shutter setting comprises shifting, in the plane of the substrate, a flat surface from a first position to a second position, the flat surface having a plurality of openings that expose the plurality of pixels when the flat surface is in the first position and that prevents exposure of the plurality of pixels when the flat surface is in the second position (Yahav, col. 25 lines 17-28)[The different shutter elements can be modulated to open and shut means that the electromechanical shutter mechanism in its first position (open) that exposes the plurality of pixels to the light that passes through the adjustable aperture and in the second position (shut) prevents exposure of the plurality of pixels to the light that passes through the adjustable aperture].

7. Claims 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yahav et al. (US Patent # 6,057,909) in view of Bawolek et al. (US PG-PUB # 2004/0012029) in further view of Nishioka (US Patent # 6,437,925).

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## [Claim 13]

Yahav in view Bawolek teaches the limitations of claim 11 but fails to teach "... wherein said positioning the shutter mechanism in the second shutter setting comprises angling at least one elongate shutter from a first position that is perpendicular to the substrate to a second position that shadows the plurality of pixels from the light source". However these limitations are known in the art as disclosed in Nishioka (col. 27 lines 22-34, lines 46-49, figure 39, 40: 188) [The light blocking plates 192 move such that when they are in perpendicular position w.r.t the optical surface the light is not blocked and when they are in an off perpendicular position the light is blocked. It is implicit in the reference that when the light blocking plates move up or down they are supported on hinges]. Therefore taking the combined teachings of Yahav, Bawolek and Nishioka it would have been obvious to one skilled in the art to have an elongate shutter having hinges coupled at least at each end such that the elongate shutter moves between the first position and the second position with respect to the row of pixels, the first position being perpendicular to the substrate and the second position being slightly off perpendicular so that the individual shutter creates a shadow on the row of pixels. Doing so the shutters used in Yahav in view of Bawolek can be made such that they are perpendicular to the substrate to let the light pass through and in an off position to the perpendicular position in order to block the light and also to construct the shutters on the same substrate as the pixels as taught in Nishioka (col. 27 lines 59-63).

## [Claim 14]

The method of claim 13 wherein the at least one elongate shutter comprises a plurality of elongate shutters that each correspond to a row of pixels from the plurality of pixels

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[Yahav, Figure 17A discloses the individual shutters 246 comprising an elongate shutter and extending along the row of pixels 242],

the plurality of elongate shutters shadowing the respective corresponding row of pixels when the shutter mechanism is in the second shutter setting such that the plurality of pixels is shadowed (Yahav, col. 25 lines 17-28)[The different shutter elements can be modulated to open and shut at different times means that the electromechanical shutter mechanism can be configured such that only one or a plurality of rows of pixels corresponding to different shutter elements can be shadowed].

[Claim 15]

The method of claim 13 wherein each of the at least one elongate shutter is coupled to the substrate by at least two hinges, respectively, the at least two hinges of the at least one elongate shutter being moved at an angle such that the at least one elongate shutter simultaneously shadows the plurality of pixels when the at least one elongate shutter is moved from the first position to the second position (Nishioka, col. 27 lines 22-34, col. 27 lines 46-49, figure 39, 40: 188)[The light blocking plates 192 move such that when they are in perpendicular position w.r.t the optical surface the light is not blocked and when they are in an off perpendicular position the light is blocked. It is implicit in the reference that when the light blocking plates move up or down they are supported on hinges which can move at an angle depending upon the electrostatic force  $F_{sub.a}$  which can be varied via a variable resistor 59, the microshutters shadow the plurality of pixels when moved from one position to another]

[Claim 16]

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The method of claim 15 wherein the at least one elongate shutter comprises a plurality of elongate shutters, each of the plurality of elongate shutters corresponding to a row of pixels from among the plurality of pixels [Yahav, Figure 17A discloses the individual shutters 246 comprising an elongate shutter and extending along the row of pixels 242], the plurality of elongate shutters each having at least two hinges coupled between a bottom edge of the elongate shutter and the substrate (Nishioka, col. 27 lines 22-34, col. 27 lines 46-49, figure 39, 40: 188)[ The light blocking plates 192 move such that when they are in perpendicular position w.r.t the optical surface the light is not blocked and when they are in an off perpendicular position the light is blocked. It is implicit in the reference that when the light blocking plates move up or down they are supported on hinges which are coupled to the silicon substrate 187 as disclosed in col. 27 lines 59-63).

### ***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- i. Yahav et al. (US Patent # 6,323,073).
- ii. Sanford (US Patent # 6,248,509).
- iii. Moor et al. (US Patent # 2002/0009821).
- iv. Sohrab Mobasser (Fuzzy image processing in Sun sensor, IEEE)
- v. Perregaux et al. (High-speed Micro-electromechanical Light Modulation arrays, IEEE).


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yogesh K Aggarwal whose telephone number is (703) 305-0346. The examiner can normally be reached on M-F 9:00AM-5: 30PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's primary examiner, Vu Le can be reached (703) 308-6613. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4700.

YKA  
February 17, 2004

  
VU LE  
PRIMARY EXAMINER